## ABSTRACT OF THE DISCLOSURE

A method of optimizing effects of a shim system on static magnetic field in an imaging system or liquid spectroscopy system, wherein for each cell of a probe disposed within the magnetic field, the resonant frequency is obtained without any current being supplied to any shim coil, then for each cell, the resonant frequency thereof is obtained by a current being supplied to one shim without any current being supplied to the other shims, and a factor is obtained for each cell due only to the magnetic field produced by current supplied to the one shim, and the resulting difference divided by the current supplied to the shim is obtained for each cell for each separate shim current, from the data an equation is derived relating the field at each cell to the individual shim current. For the case when the number of cells is equal to or less than the number of shim coils, this equation is inverted to give the shim current values to produce the same field at all cells. For the case when the number of cells is greater than the number of shim coils, a least square method is applied utilizing the equation and matrix factors to determine the current values which produce the least errors in the cells.